LISTING OF THE CLAIMS:

The current claim set should replace any claim set of record.

Claim 1. (Currently amended): A method of inducing osteoblastic differentiation and inhibiting adipocyte differentiation of mammalian mesenchymal stem cells (MSCs) comprising treating mammalian ~~mesenchymal cells~~ MSCs with at least one oxysterol,

wherein the at least one oxysterol is selected from the group consisting of 20S-hydroxycholesterol, 22S-hydroxycholesterol, 22R-hydroxycholesterol and 25-hydroxycholesterol, or an active portion of any one of 20S-hydroxycholesterol, 22S-hydroxycholesterol, 22R-hydroxycholesterol, or 25-hydroxycholesterol; and

wherein the MSCs are treated with the at least one oxysterol under conditions that are effective to induce osteoblastic differentiation and to inhibit adipocyte differentiation of the MSC.

Claim 2. (Canceled):

Claim 3. (Previously presented): The method of claim 1, wherein the at least one oxysterol is a combination of oxysterols selected from the group consisting of 20S-hydroxycholesterol and 22R-hydroxycholesterol, and 20S-hydroxycholesterol and 22S-hydroxycholesterol.

Claim 4. (Withdrawn - Currently amended): The method of claim 1, further comprising treating the mammalian ~~mesenchymal cells~~ MSCs with at least one secondary agent selected from the group consisting of parathyroid hormone, sodium fluoride, insulin-like growth factor I, insulin-like growth factor II and transforming growth factor beta.

Claim 5. (Withdrawn - Currently amended): The method of claim 1, further comprising treating the mammalian ~~mesenchymal cells~~ MSCs with at least one secondary agent selected from the group consisting of cytochrome P450 inhibitors, phospholipase activators, arachadonic acid, COX enzyme activators, osteogenic prostanoids and ERK activators.

Claim 6. (Currently amended): A method of stimulating mammalian cells to express a level of a biological marker of osteoblastic differentiation which is greater than the level of a biological marker in untreated cells, comprising exposing a mammalian cell to a selected dose of at least one oxysterol,

wherein the at least one oxysterol is selected from the group consisting of 20S-hydroxycholesterol, 22S-hydroxycholesterol, 22R-hydroxycholesterol and 25-hydroxycholesterol, or an active portion of any one of 20S-hydroxycholesterol, 22S-hydroxycholesterol, 22R-hydroxycholesterol, or 25-hydroxycholesterol,

thereby resulting in a level of expression of a biological marker of osteoblastic differentiation which is greater than the level of a biological marker in untreated cells.

Claim 7. (Canceled):

Claim 8. (Previously presented): The method of claim 6, wherein the at least one oxysterol is a combination of oxysterols selected from the group consisting of 20S-hydroxycholesterol and 22R-hydroxycholesterol, and 20S-hydroxycholesterol and 22S-hydroxycholesterol.

Claim 9. (Withdrawn - Previously presented): The method of claim 6, further comprising treating the mammalian mesenchymal cells with at least one secondary agent selected from the group consisting of parathyroid hormone, sodium fluoride, insulin-like growth factor I, insulin-like growth factor II and transforming growth factor beta.

Claim 10. (Withdrawn - Previously presented): The method of claim 6, further comprising treating the mammalian mesenchymal cells with at least one secondary agent selected from the group consisting of cytochrome P450 inhibitors, phospholipase activators, arachadonic acid, COX enzyme activators, osteogenic prostanoids and ERK activators.

Claim 11. (Original): The method of claim 6 wherein the biological marker is an increase in at least one of alkaline phosphatase activity, calcium incorporation, mineralization or expression of osteocalcin mRNA.

Claim 12. (Currently amended): The method of claim 6 wherein the mammalian cells are selected from the group consisting of ~~mesenchymal stem cells~~ MSCs, osteoprogenitor cells and calvarial organ cultures.

Claim 13. (Canceled)

Claim 14. (Canceled)

Claim 15. (Currently amended): A method of treating a patient suffering from bone loss and/or requiring bone repair, to increase the differentiation of ~~marrow stromal cells~~ MSCs into osteoblasts, comprising administering to the patient at least one oxysterol at a therapeutically effective dose in an effective dosage form at a selected interval to induce differentiation of MSCs into osteoblasts, thereby increasing increase the number of osteoblasts present in bone tissue.

Claim 16. (Currently amended): The method of claim 15, wherein the at least one oxysterol is selected from the group consisting of 20S-hydroxycholesterol, 22S-hydroxycholesterol, 22R-hydroxycholesterol, and 25-hydroxycholesterol, ~~and pregnanolone,~~ or an active portion of any one of 20S-hydroxycholesterol, 22S-hydroxycholesterol, 22R-hydroxycholesterol, or 25-hydroxycholesterol~~, or pregnanolone~~.

Claim 17. (Previously presented): The method of claim 15, wherein the at least one oxysterol is a combination of oxysterols selected from the group consisting of 20S-hydroxycholesterol and 22R-hydroxycholesterol, and 20S-hydroxycholesterol and 22S-hydroxycholesterol.

Claim 18. (Withdrawn - Previously presented): The method of claim 15, further comprising treating the patient with at least one secondary agent selected from the group consisting of parathyroid hormone, sodium fluoride, insulin-like growth factor I, insulin-like growth factor II or transforming growth factor beta.

Claim 19. (Currently amended): A method of treating a patient suffering from bone loss and/or

requiring bone repair to induce bone formation comprising administering to the patient at least one oxysterol at a therapeutically effective dose in an effective dosage form at a selected interval to increase bone mass.

Claim 20. (Currently amended): The method of claim 19, wherein the at least one oxysterol is selected from the group consisting of 20S-hydroxycholesterol, 22S-hydroxycholesterol, 22R-hydroxycholesterol, and 25-hydroxycholesterol, ~~and pregnanolone,~~ or an active portion of any one of 20S-hydroxycholesterol, 22S-hydroxycholesterol, 22R-hydroxycholesterol, or 25-hydroxycholesterol~~, or pregnanolone~~.

Claim 21. (Previously presented): The method of claim 19, wherein the at least one oxysterol is a combination of oxysterols selected from the group consisting of 20S-hydroxycholesterol and 22R-hydroxycholesterol, and 20S-hydroxycholesterol and 22S-hydroxycholesterol.

Claim 22. (Withdrawn - Previously presented): The method of claim 19, further comprising treating the patient with at least one secondary agent selected from the group consisting of parathyroid hormone, sodium fluoride, insulin-like growth factor I, insulin-like growth factor II and transforming growth factor beta, at a therapeutically effective dose.

Claim 23. (Previously presented): The method of claim 19, further comprising treating the patient with at least one secondary agent selected from the group consisting of bisphosphonates, selective estrogen receptor modulators, calcitonin, and vitamin D and calcium, at a therapeutically effective dose.

Claim 24. (Currently amended): A method of treating a patient exhibiting clinical symptoms of osteoporosis comprising administering to the patient at least one oxysterol at a therapeutically effective dose in an effective dosage form at a selected interval to ameliorate the symptoms of the osteoporosis.

Claim 25. (Currently amended): The method of claim 24, wherein the at least one oxysterol is selected from the group consisting of 20S-hydroxycholesterol, 22S-hydroxycholesterol, 22R-

hydroxycholesterol, and 25-hydroxycholesterol, ~~and pregnanolone,~~ or an active portion of any one of 20S-hydroxycholesterol, 22S-hydroxycholesterol, 22R-hydroxycholesterol, or 25-hydroxycholesterol~~, or pregnanolone~~.

Claim 26. (Previously presented): The method of claim 24, wherein the at least one oxysterol is a combination of oxysterols selected from the group consisting of 20S-hydroxycholesterol and 22R-hydroxycholesterol, and 20S-hydroxycholesterol and 22S-hydroxycholesterol.

Claim 27. (Withdrawn - Previously presented): The method of claim 25, further comprising treating the patient with at least one secondary agent selected from the group consisting of parathyroid hormone, sodium fluoride, insulin-like growth factor I, insulin-like growth factor II and transforming growth factor beta, at a therapeutically effective dose.

Claim 28. (Previously presented): The method of claim 25, further comprising treating the patient with at least one secondary agent selected from the group consisting of bisphosphonates, selective estrogen receptor modulators, calcitonin, and vitamin D and calcium, at a therapeutically effective dose.

Claim 29. (Withdrawn - Currently amended): A method of treating a patient suffering from bone loss and/or requiring bone repair to induce bone formation comprising: harvesting mammalian ~~mesenchymal stem cells~~ MSCs; treating the ~~mammalian mesenchymal cells~~ MSCs with at least one oxysterol, wherein the at least one oxysterol induces the ~~mesenchymal stem cells~~ MSCs to express at least one cellular marker of osteoblastic differentiation; administering the differentiated cells to the patient.

Claim 30. (Withdrawn - Currently amended): The method of claim 29, wherein the at least one oxysterol is selected from the group consisting of 20S-hydroxycholesterol, 22S-hydroxycholesterol, 22R-hydroxycholesterol, and 25-hydroxycholesterol, ~~and pregnanolone,~~ or an active portion of any one of 20S-hydroxycholesterol, 22S-hydroxycholesterol, 22R-hydroxycholesterol, or 25-hydroxycholesterol~~, or pregnanolone~~.

Claim 31. (Withdrawn - Previously presented): The method of claim 29, wherein the at least one oxysterol is a combination of oxysterols selected from the group consisting of 20S-hydroxycholesterol and 22R-hydroxycholesterol, and 20S-hydroxycholesterol and 22S-hydroxycholesterol.

Claim 32. (Withdrawn): The method of claim 29 further comprising administering at least one oxysterol at a therapeutically effective dose in an effective dosage form at a selected interval.

Claim 33. (Withdrawn - Previously presented): The method of claim 29, further comprising treating the patient with at least one secondary agent selected from the group consisting of parathyroid hormone, sodium fluoride, insulin-like growth factor I, insulin-like growth factor II and transforming growth factor beta, at a therapeutically effective dose.

Claim 34. (Withdrawn - Previously presented): The method of claim 29, further comprising treating a patient with at least one secondary agent selected from the group consisting of bisphosphonates, selective estrogen receptor modulators, calcitonin, and vitamin D and calcium, at a therapeutically effective dose.

Claim 35. (Withdrawn): The method of claim 29, further comprising administering the differentiated cells to the patient by systemic injection.

Claim 36. (Withdrawn): The method of claim 29, further comprising administering the differentiated cells to the patient by application of the cells to a selected site where bone formation is desired.

Claim 37. (Withdrawn): An implant for use in the human body comprising, a substrate having a surface, wherein at least the surface of the implant includes at least one oxysterol in an amount sufficient to induce bone formation in the surrounding bone tissue.

Claim 38. (Withdrawn): The implant of claim 37, wherein the substrate is formed into the shape of a pin, screw, plate, or prosthetic joint.

Claim 39. (Withdrawn): An implant for use in the human body comprising, a substrate having a surface, wherein at least the surface of the implant includes mammalian cells capable of osteoblastic differentiation.

Claim 40. (Withdrawn): An implant for use in the human body comprising, a substrate having a surface, wherein at least the surface of the implant includes osteoblastic mammalian cells.

Claim 41. (Withdrawn - Currently amended): A medicament for use in the treatment of bone disorders comprising a therapeutically effective dosage of at least one oxysterol selected from the group consisting of 20S-hydroxycholesterol, 22S-hydroxycholesterol, 22R-hydroxycholesterol, and 25-hydroxycholesterol ~~, and pregnanolone~~, or an active portion of any one of 20S-hydroxycholesterol, 22S-hydroxycholesterol, 22R-hydroxycholesterol, or 25-hydroxycholesterol ~~, or pregnanolone~~.